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Who Gain and Lose from the Minimum Wage Policy?

(Siapa Untung dan Rugi daripada Dasar Upah Minimum?)

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AABSTRACT

This study examines the effectiveness of the minimum wage as a mechanism for income redistribution among major ethnic groups in Malaysia. Taking into consideration the benefits and costs of minimum wage, the results show that the wage policy potentially boosts the incomes of ethnic Indians and ethnic Malays, whereas the wage policy marginally affects ethnic Chinese. The estimates also do not provide strong support for the notion that minimum wage legislation in Malaysia is likely to be an effective policy for income redistribution. The effectiveness of the minimum wage legislation is constrained by its limitation to account for informal sector workers.

Keywords: Minimum wage; input-output; income distribution; ethnic groups

ABSTRAK

Kajian ini mengkaji keberkesanan upah minimum sebagai satu mekanisma pengagihan semula pendapatan antara kumpulan etnik utama di Malaysia. Dengan mengambil kira faedah dan kos upah minimum, dapatan kajian menunjukkan dasar upah berpotensi untuk meningkatkan pendapatan etnik India dan etnik Melayu, manakala dasar upah ini member kesan yang kecil kepada etnik Cina. Dapatan kajian juga tidak memberi sokongan yang kuat kepada tanggapan bahawa dasar upah minimum di Malaysia berkemungkinan menjadi dasar yang berkesan untuk pengagihan semula pendapatan. Keberkesanan dasar upah minimum dikekang oleh liputan yang tidak mengambil kira pekerja di sektor tidak formal.

Katakunci: Upah minimum; input-output; agihan pendapatan; kumpulan etnik

MOTIVATION

Malaysia announced its first minimum wage legislation on 1 May 2012. The minimum wage standard was established only for employees in private sectors at a monthly rate of MYR900 for the West Malaysia (Peninsular Malaysia) and MYR800 for East Malaysia (states of Sabah and Sarawak, and federal territory of Labuan). The main justification for the minimum wage legislation is to redistribute wealth among low-income workers. In addition, the minimum wage legislation can also promote a more efficient allocation of human capital through productivity, which supports the current governmental objective of attaining high-income country status by 2020. What will the effects on the household income be after the implementation of the minimum wage standards in the economy? At present, no general consensus on the effects of minimum wage standards on household income has emerged.

The vast literature on minimum wage policies demonstrates that studies using micro data do not always find welfare increases with a rise in the minimum wage. For example, Saget (2001) concludes that minimum wage policies in developing countries do not affect the poorest share of a population, but the upper level of the low income population. Bird and Manning (2008) find that minimum wage policies are unlikely to be an effective anti-poverty instrument in Indonesia. Studies in developing countries show that the role of minimum wage policies as a redistributive policy tool is problematical because of two main reasons. First, the minimum wage increase only benefits the formal sector workers, whereas a large proportion of informal sector workers are not covered by the minimum wage legislation (see for example, Alaniz et al. 2011; Bird & Manning 2008; Bosch & Manacorda 2008; Kristensen & Cunningham 2006; Gindling & Terrell 2005; Maloney & Núnes 2004). Secondly, the non-compliance with the minimum wage legislation was rampant among the sectors (see for example, Gindling & Terrell 2009; Cortes 2005).

The empirical evidence raises the broader question of whether minimum wage legislation benefits Malaysian households. In particular, the extent to which minimum wage standards bring about beneficial changes in income distribution by raising incomes of low-income groups is questionable, which is an issue addressed in the present study Income distribution can be analyzed from different perspectives, such as by income class,

employment status and skills, which depend upon policy interests. The specific focus of the present study concerns income distribution among the major ethnic groups: ethnic Malays, ethnic Chinese and ethnic Indians. The approach is of great interest for two principal reasons. First, past and current development policies include specific regarding the standard of living among ethnic Malays, ethnic Chinese and ethnic Indians. The ethnic riots in May of 1969 highlighted the dangers that are inherent in a multi-racial society when ethnic prejudices are exacerbated by economic disparities (see for example, Heng 1997; Shari 2000; Faaland et al. 2003). Second, analyzing income inequality in Malaysia is unique in the sense that the ethnic Malays, who are the largest population, face a lower income share than the other relatively smaller ethnic groups (i.e., ethnic Chinese and ethnic Indians). The ethnographic composition of the Malaysian population in 2005 consisted of ethnic Malays (61% of the population in 2005), the ethnic Chinese (26%), the ethnic Indians (8%) and a group other ethnic minorities (5%). This is in contrast with other developing countries whose lower income groups are commonly associated with the smaller share in the population (see the study of Van de Walle and Gunewardena (2011) regarding Vietnam; and the study of Agostini et al. (2010) regarding Chile). For example, the per capita monthly income of ethnic Malays in 2005 was 61% and 26% lower than the per capita incomes of ethnic Chinese and ethnic Indian incomes, respectively. More importantly, 33% of ethnic Malay workers are paid below the poverty line income level, which is set at Malaysian *Ringgit* (MYR) 800 per month, compared to 14% of ethnic Chinese workers and 29% of ethnic Indian workers.

For empirical analysis, the analysis of the increase in minimum wage must simultaneously examine impacts on income and cost of living of the household. First, the micro data from the household income survey (HIS) is combined with data concerning minimum wage to determine the income effect. Second, following the implementation of the minimum wage standards, the increase in labor costs will presumable be passed on to consumers by firms in the form of higher prices. To estimate the price effect, an input-output price model is applied to translate the higher labor costs into the total production costs for each sector. These two analyses provide a more robust indication of the implication of the minimum wage standards on real household income.

The rest of this paper is organized as follows. The next section briefly provides a background of the Malaysian labor market and the minimum wage legislation. Section 3 discusses the methodological framework employed in the present study and the data utilized. Section 4 presents the simulation results for the implemented minimum wages. Finally, concluding remarks are provided in Section 5.

THE MALAYSIAN LABOR MARKET AND THE NEED FOR MINIMUM WAGE STANDARDS

One may ask the extent to which a minimum wage standard should be implemented in the Malaysian economy. Table 1 presents the distribution of wage earners according to their monthly payment (i.e., basic wages) for selected sectors and provides an answer to the aforementioned question, demonstrating that most

TABLE 1. Distribution of Wage Earners in Selected Sectors, 2010

	Agriculture, forestry and fishing	Manufacturing	Building and construction	Wholesale and retail trade	Transport and storage
Total labors ('000)	502.6	1,611.4	706.1	236.8	398.6
Income share					
Less than RM700	54.5	3.6	19.3	21.8	16.5
RM701 - RM799	6.1	32.7	4.3	1.5	2.8
RM800 - RM899	10.2	9.3	9.4	7.8	8
RM900 - RM999	5.3	4.8	7.2	4.1	5.6
RM1,000 - RM1,099	4.9	5.0	8.6	7.0	6.9
RM1,100 - RM1,199	1.6	1.6	2.6	1.4	2.5
RM1,200 - RM1,999	9	22.7	29.5	26.5	34.3
RM2,000 - RM3,999	3.5	15.4	14.3	22.7	17.4
RM4,000 - RM6,999	4.4	3.6	3.6	5.1	3
RM7,000 - RM9,999	0.3	0.9	0.5	1.5	1.8
More than RM10,000	0.2	0.4	0.7	0.6	1.2

Sources: Osman et al. (2011)

workers are paid low wages. Approximately 61% of workers in the agriculture, forestry and fishing industries are paid below the poverty line income (i.e., below MYR 800). The percentage of low-income workers for the manufacturing; building and construction; wholesale and retail trade; and transport and storage industries receiving wages below poverty line income levels are approximately 36%, 24%, 23% and 19%, respectively. The statistics provide a *prima facie* case to introduce minimum wage legislation in Malaysia.

A second related issue involves the distributional impact of a minimum wage standard. In this case, the key question concerns the extent to which an increase in basic wages has significant implications regarding overall income inequalities. To demonstrate the role of basic wage, the income of households is presented by source in Table 2. In Table 2, incomes are broadly distinguished into compensation of employees and other income types (e.g., income from self-employment, rent, interest and other periodical transfer received) in rows (2) and (5). Compensation of employees includes remuneration (in cash or in kind) payable for production activities to employees in return for work performed during the accounting period. The components of compensation of employees comprise wages and salaries; allowances; and other payments received in kind. The compensation of employees is further disaggregated into basic wages (salaries and wages) and other payments in kind, which include allowances, bonuses, and other cash and non-cash payments in rows (3) and (4). As demonstrated in Table 2, basic wages constitute the major source of household income, ranging from 49% for ethnic Chinese to 66% for other minority ethnicities. Other income types, which essentially involve self-employment, explain only about one-third of total income. Thus, strong support exists for the argument that raising basic wages through the implementation of minimum wage standards will have large effect in reducing inequalities in relation to per capita household income across the ethnic groups.

Previously, three mechanisms were used by the Malaysian government to determine wages: the Wages Councils Act 1947 (revised 1977), collective bargaining and market forces. Wage determination for the first two mechanisms usually involves a mutual agreement between employers and employees and thus they can be considered to fall under the definition of 'minimum wage' (Osman et al. 2012). However, these wage mechanisms have three limitations: (1) the mechanisms are insufficient to provide a decent standard of living (because the rates were low); (2) the mechanisms are rarely updated and monitored, and (3) the mechanisms only provide limited coverage (i.e., the mechanisms only cover a small number of workers and do not cover the majority of low income workers). Thus, a comprehensive minimum wage standard was needed. In July 2011, the National Wages Consultative Council Act (2011) was passed by the Parliament of Malaysia and gazetted on 15 September 2011. As a consequence, the Wages Council Act 1947 (revised 1977) was repealed. On 1 May 2012, the Prime Minister announced the following minimum wage standards for private sectors:

1. MYR900 or MYR4.33 per hour for employees in the Peninsular Malaysia.
2. MYR800 or MYR3.85 per hour for employees in Sarawak, Sabah and Federal Territory of Labuan.

The minimum wage legislation covers all employees in all formal economic sectors with the exception of those in the domestic service sector, such as maids and gardeners. The rates will take effect six months from the date the Minimum Wage Order is gazetted. However, the effective date for small-scale employers and micro enterprises was extended by another six months to give them more time to make preparations so that their businesses would not be largely affected.

As in many other countries, the minimum wage legislation has multiple objectives. In addition to raising the living standard of low-wage workers who are deemed to receive income below the poverty line threshold, strong pressure is being exerted in Malaysia to reduce foreign labor dependence, particularly in regards to the unskilled labor force (Bank Negara Malaysia 2013). In line with the government agenda to attain high-income country status by 2020, the introduction of minimum wage legislation will not only enhance the demand for skilled labor (thus, likely reducing the dependency on unskilled labor), but

TABLE 2. Monthly Per Capita Income and Sources of Income, 2005

		Malay	Chinese	Indian	Others
Monthly per capita income (RM)	(1)	2,701	4,398	3,406	2,615
Distribution of income by sources (%)					
Compensation of employees	(2)	71.10	62.23	74.44	88.28
Wages and salaries (basic pay)	(3)	52.60	49.00	56.34	66.21
Other payments (e.g. allowances)	(4)	18.51	13.23	18.11	22.06
Other income types	(5)	28.90	37.77	25.56	11.72

Sources: Department of Statistics Malaysia (2006)

Notes: Total income = (2) + (5), (2) = (3) + (4).

also stimulate innovation (Economic Planning Unit 2011). Furthermore, it is likely that paying high wages may be profitable for firms because they might increase the productivity and efficiency of the workers (e.g., Croucher & Rizov 2012).

METHODOLOGY AND DATA

Malaysia has a rich micro-dataset concerning the income and expenditure of households, which can be used to evaluate the effects of minimum wage on real income. The household income survey (HIS) is a multi-purpose household survey conducted to gather detailed information on income and some expenditures of households (such as income tax) and takes into account demographic and labor force characteristics of households across socio-economic groups. The information allows for the identification of low-wage workers and the simulation of their additional earnings from the minimum wage legislation.

Figure 1 summarizes the steps taken to develop the simulation analysis. The HIS for 2005 (see Department of Statistics Malaysia, 2006a) is used to simulate the additional earnings of each identified low-wage workers following the implementation of minimum wage standards. The increase in income is estimated by the following expression.

$$\Delta y_j = \sum_i^n \Delta \tilde{w} + \sum_k^m w \qquad (1)$$

where $i = 1, \ldots, n$ are the low-wage workers in household group j, $\Delta \tilde{w}$ is the change in the low-wage workers after the simulation and is income of high-wage workers (i.e., above the minimum wages) for $k = 1,\ldots.m$.

Households are classified according to the major ethnic groups (i.e., ethnic Malays, ethnic Chinese, ethnic Indians and a group of other minority ethnics). Consequently, households are able to be quantified according to the different income levels of various ethnic groups that are affected by the minimum wage legislation. The latest available HIS is for 2010, but the latest available input-output table is for the 2005 base year. For the purpose of consistency between the structures of production (refer to input-output tables) and income (refer to HIS), the 2005 HIS is used. Thus, the structures of production and income in 2005 are implied in the analyses. The application of 2005 production and income data does not seem unreasonable because while changes in values (i.e. output and income) take place over time, the structures of production and income are fairly stable. Changes in income share between 2000 and 2005 are calculated in the HIS. The results show that the percentile-based changes in income between these periods are: 1% for ethnic Malays (47% in 2005 and 46% in 2000); -5% for ethnic Chinese; -2% for ethnic Indians; and 6% for the group of other minority ethnicities. The changes in input-output coefficients between 2000 and 2005 are also measured. By expressing the 2005 input-output table in 2000 prices through the use of a double deflation technique, the results show that the change in production structures is very minimal. The mean absolute deviation (MAD, see Miller and Blair 2009) is calculated in the present study as a measure of the difference between two production structures and obtains an average index

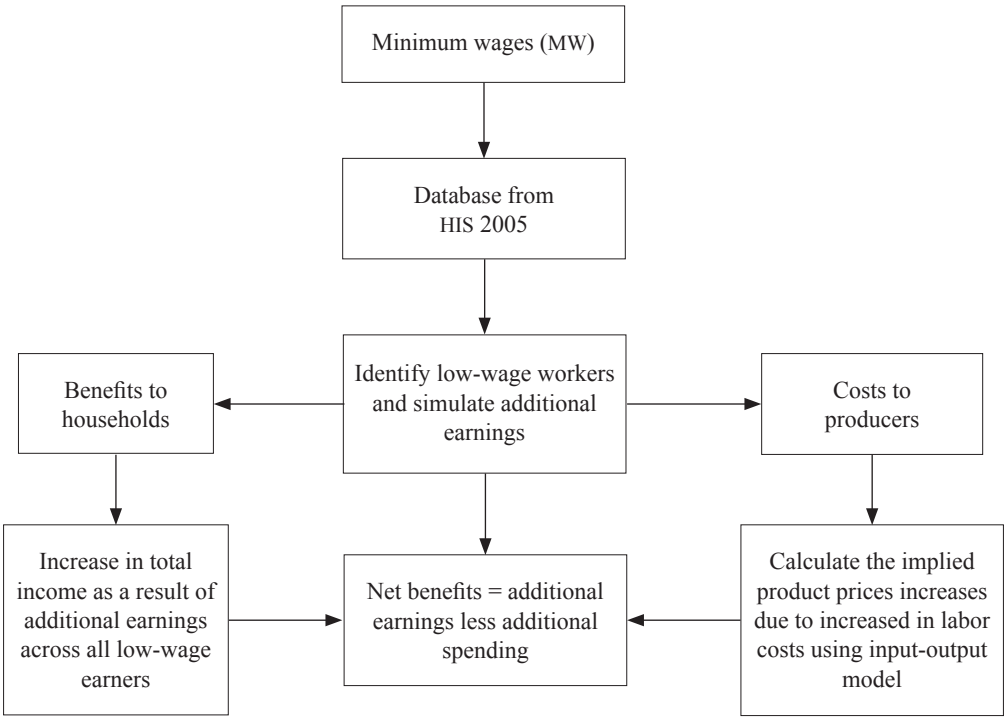

FIGURE 1. Steps in Developing Simulation of Minimum Wages

of 0.023 (i.e., the closer the value of the statistics to zero, the more stable the production structures).

Not all workers will benefit from the minimum wage legislation since the coverage of the minimum wage standard is limited to formal private sector workers. The informal sector workers, such as self-employed and unpaid family workers, are not covered by the minimum wage legislation. Thus, it is important in the simulation analysis to distinguish between two types of workers: formal and informal sector workers. In recent years, national statistical offices and international organizations, such as the International Labour Organization, have invested considerable effort to account for official informal sectors statistics. In the simulation, only the increase in income of the low-wage formal workers is allowed, while the income of low-wage informal sectors remains unchanged. As a result, the increase in total income in the economy is completely explained by the income of formal workers.

Informal workers can be defined in different ways and no generally accepted definition exists. Depending on which definition of the informal sector is used, the findings on the impact of minimum wage may differ (for a useful discussion concerning the definition of informal sectors, see System of National Accounts (United Nations 1993) and Guidelines Concerning a Statistical Definition of Informal Employment (International Labour Organization 2012)). For example, in Brazil and Mexico, minimum wage standards affect the informal workers when the informal sector is defined as workers who do not have a signed work permit (e.g., see, Kristensen & Cunningham 2006; Bosch & Manacorda 2008). On the other hand, when the commonly used definition of self-employed and unpaid family workers is used, no evidence exists that minimum wage standards affect the distribution of wages (e.g., see Alaniz et al. (2011) regarding Nicaragua; Bird and Manning (2008)regarding Indonesia; Gindling and Terrell (2005)regarding Costa Rica; and Maloney and Núnes (2004) regarding Colombia).

Although the informal sectors can be defined in various ways, difficulties arise when evaluating whether the available data can support the definition. Taking this limitation into account, employment in the informal sector are considered to be those legal employments that are not subject to national social security scheme. Specifically, the contribution of employee's provident fund is used to distinguish between formal and informal workers. The limitation in defining informal sectors according to the employment status (e.g. self-employed and unpaid family workers) exists because of classification constraints in the HIS 2005. For example, employer and self-employment is classified in one category of employment with no means of disaggregating the figures. Under this definition, the share of informal workers to total workforce is found to be large, consistent with other developing countries. The dataset demonstrates that the share of informal workers to the total number of individuals in the workforce is as follows: 83% for ethnic Malays; 78% for ethnic Chinese; 72% for ethnic Indians; and 91% for other ethnicities.

Once the wage of low-wage workers is simulated, the amount of the increase in total wage costs for each production sector can be calculated. The input-output model is used to translate the higher labor costs into the total production costs in each sector. Specifically, the input-output model analyzes interdependencies among different production sectors that purchase goods and services from other sectors as production inputs, which, in turn, produce goods and services that are sold to other sectors. The modeling formulation begins with an ordinary input-output table, with imports separated from the domestic deliveries.The resulting interdependencies among production activities can be shown based on the following material balance equation:

$$x = \sum Z + f + e \tag{2}$$

where x is the vector of total output delivered to the three components represented by the matrix domestic intermediate input, Z represents inputs demanded by sector j as intermediate consumption from sector i, f represents the vector of domestic final demands and e represents the vector of exports. In the standard input-output model, the above equation can be transformed and solved in matrix notation as follows:

$$\begin{aligned} x &= Ax + (f + e) \\ &= (I - A)^{-1}(f + e) = L(f + e) \end{aligned} \tag{3}$$

where I is the identity matrix and $A(A = Z\hat{x}^{-1})$ is the domestic input coefficient matrix. Each element of the Leontief inverse matrix shows total the output effects (both the direct and indirect effects) for any sector j to satisfy each unit of final demand. In this model formulation, quantity levels are assumed to be varied while prices are fixed. To keep the prices fixed, assumptions of an excess capacity and unused resources exist; and linear relationships (fixed input coefficients) are presumed throughout the framework. This type of modeling is referred to as the quantity model.

The dual for the quantity model is known as price model (also termed as the cost-push model). The price model is useful for the analysis of price shocks given that prices may vary although quantities are assumed to be fixed. In the standard price model version, the Leontief inverse matrix is frequently transposed and the vector of exogenous cost is expressed in terms of column vectors instead of row vectors (Miller and Blair 2009). In which case,

$$\begin{aligned} p &= A'p + lp_l + vp_v + mp_m \\ &= (I - A)^{-1}(lp_l + vp_v + mp_m) = L'(lp_l + vp_v + mp_m) \end{aligned} \tag{4}$$

Setting p_l, p_v and p_m at unity, (4) can be further simplified as (5)

$$L'(l + v + m) \quad (5)$$

where, p is the vector of normalized prices for the particular sector; A' is a transposition of the matrix of domestic input coefficient; p_l, p_v and p_m are the vector of normalized prices for the labor, capital and import (prices per category); and l, v and m are termed as the vector of labor coefficient (labor per unit of output), capital coefficient (capital per unit of output) and import coefficient (import per unit of output), respectively.

For the base-year equilibrium, $L'(lp_l + vp_v + mp_m)$ is the equivalent of $L'(l + v + m)$ since p_l, p_v and p_m are set at unity. Although the same coefficients of the inverse matrix $(I - A)^{-1}$ are applied for the quantity model in (3) and price model in (4), both models are independent. In the quantity model, x is determined by $(f + e)$ and p is influenced by $(l + v + m)$ in the price model. This implies that supply is perfectly price elastic in the quantity model,whereas demand is perfectly price inelastic in the price model (an extensive discussion concerning price and quantity models is provided by Oosterhaven (1996)).

In the analyses, p_v and p_m are constant (i.e., remained unchanged) and p_l is the only variable. When $p_l = 1$, no deviation in the cost (price) of labor from its baseline value exists. However, for example, when the cost of labor is double, the shock is introduced in the system as $p_l = 2$. In general form, the impacts of changes in the cost of labor on prices of all commodities can be examined as follows:

$$\Delta p = L'(l\Delta p_l + vp_v + mp_m) \quad (6)$$

To run the input-output price model, the latest input-output table for 2005 published by the Department of Statistics Malaysia (2010) is used. The original input-output table consists of 120 sectors classified according to the Malaysia Standard Industrial Classification (MSIC, see Department of Statistics Malaysia, 2000). For the present analysis, the classification of sectors in the input-output table is reduced to 76 sectors through aggregation. The reason for the aggregation is that the disaggregation of income by household groups in the HIS cannot support all 120 sectors in an input-output table.

Once the magnitude of price increases for all 76 sectors is determined in (6), the next step is to determine the extent to which the increases in commodity prices affect household expenditures. For this purpose, extra expenditures (ΔE) that each household group j must pay in order to maintain the same bundle of goods and services as before the wage increase are calculated as follows:

$$\Delta E_j = \Delta p_i q_i \quad (7)$$

Where $i = 1, \ldots, n$ are the product by sectors; Δp is the change in price of product i that obtained from (6); and q is the budget share. When estimating the expenditure effects associated with the higher prices, the assumption is made that no substitution among consumption of commodities occurs (i.e., a zero price elasticity of demand for all commodities). This is a reasonable approximation for the short-run analysis where households are likely to be consuming the minimum amount of the most affected commodities given the current level of income.

The household expenditure data are represented by a vector of private consumption in the input-output table, but no disaggregation of household by ethnic groups exists. To disaggregate private consumption into ethnic groups, the household expenditure survey (HES) for 2005 is used (see Department of Statistics Malaysia, 2006b). The final step of the analysis is to calculate the net benefits for each household group $j(\Delta y_i - \Delta E_j)$.

In line with McCurdy and McIntyre (2001) and Bird and Manning (2008), the minimum wage effects are simulated within a static input-output framework (i.e., the model is linear in nature and this linearity has several implications). In the context of perfectly price inelastic demand, linearity implies that the increase in labor costs will result in the producers transmitting the higher costs of production to the final users (i.e., consumers) by increasing the price of outputs (see, for example, Oosterhaven 1996). Thus, the analyses are run by assuming that no changes occur in the quantity of labor and productivity. This, however, may not be realistic because in, producers tend to reduce the use of labors and may substitute with other relative inexpensive inputs in response to increasing labor costs in order to minimize the total costs without affecting the current level of production (see, for example, Welsch and Ochsen 2005).

The linearity assumption may lead to open criticism of the use of input-output model due to its inability to incorporate market mechanisms and policy instruments that work through price incentives. However, the use of input-output model can be justified due to the existence of a short- and long-run production cost functions. In the short-run (during one period), production techniques are unlikely to change, which, in turn, implies that the composition of inputs used in the production is fixed. A change in production techniques requires adjustments concerning capital endowments, but this adjustment may not be accommodated within a shorter period. Moreover, even if the substitution does occurs, it may be reflected only at disaggregated levels (or at firm levels), while at aggregated levels (or at industry levels) the composition of inputs is likely to be stable.

RESULTS AND DISCUSSION

The previous section discusses how the wage income has been simulated in the present analysis. This section

examines how the net benefits from the minimum wage implementation are distributed across household by ethnic groups. The effects are assessed by comparing outcomes under the minimum wage implementation with the baseline scenario (i.e., without minimum wage). In other words, results are obtained under a 'what-if' analysis. In the simulation, all production sectors are assumed to fully comply with the minimum wage legislation. In practice, the level of compliance varies across different sectors and occupations; and also differs across countries (see Bird and Manning (2008); Gindling and Terrell (2009)). However, to study the level of compliance, the HIS for the periods before and after the implementation of minimum wage standards are required (e.g., see Gindling and Terrell (2009)). The analysis of different degrees of compliance is considered to be beyond the scope of the present study.

The results are provided in Table 3. Rows (2) and (3) show the monthly per capita income before and after the implementation of the minimum wage standards. The increase in household income in row (3) is completely due to wage increases of formal workers, whereas the wages of informal workers remain unchanged (see the methodology section). The results show that the minimum wage standards have limited effects on the distribution of income. The per capita income gap between ethnic Malays and ethnic Chinese improve slightly, from 1.628 to 1.570 (the last figure indicates that each *Ringgit* earned by ethnic Malays is, on average, equivalent to 1.570 *Ringgit* earned by ethnic Chinese). On the other hand, the index of income inequality between ethnic Malays and ethnic Indians marginally increases from 1.261 to 1.274. Thus, the findings are not regarded as evidence supporting the view that the minimum wage legislation in Malaysia will have beneficial distributional effects among ethnic groups.

Distributional effects can be explained by income effects and expenditure effects. In relation to the income effects, results in row (4) show that the benefits of minimum wage legislation are likely to be enjoyed more by ethnic Indians (5.89%) and ethnic Malays (4.80%),whereas ethnic Chinese are the least beneficial group (1.06%). Why do ethnic Chinese households have limited income growth compared to other groups? To answer this question, the percentage share of workers that have been paid below the minimum wage is tabulated in row (1). Only 26% of total formal ethnic Chinese workers are paid less than the minimum wage compared to 56% and 54% in the case of ethnic Indians and ethnic Malays, respectively. This explains why the income increase after the minimum wage implementation for ethnic Chinese is relatively lower than ethnic Malays and ethnic Indians. Although other ethnic minorities have a large share of low-wage workers (73%), the income of this group only increases by 3.09%, which is lower than the ethnic Indians and ethnic Malays. This can be explained by the interplay of two factors: (i) the large number of ethnic minorities residing in East Malaysia (i.e., the states of Sabah and Sarawak); and (ii) the minimum wage standards for East Malaysia are set at MYR800, which is lower than the standard set in West Malaysia. Consequently, an increase in the income of other minority ethnicities is expected to be lower than other ethnic groups.

The expenditure effect simulates the increase in household expenditures in order to maintain the consumption of the same bundle of goods and services after the minimum wage increase. While about 46% of households (i.e., only formal workers) benefit from the increase in the minimum wage, all households (i.e., both formal and informal workers) are assumed to pay higher consumer prices. The minimum wage increase results in higher labor costs and firms respond by increasing commodity prices. In the present analysis, minimum wages increases are observed to drive a 6.4% increase in labor costs, which, in turn, leads to an increase in the average commodity prices of1.8%. This provides an indication that minimum wage standards have a marginal effect on producers. The impacts on individual sectors range from 0.21% for crude oil and natural gas (essentially a capital-intensive sector) to 8.4% for oil palm (essentially a labor-intensive sector). Appendix 1 gives the detailed results of the price increases for 76 sectors.

The minimum wage legislation will primarily increase production costs in the labor-intensive and low-technological sectors. To confirm this expectation, the percentage increase in commodity prices over labor

TABLE 3. Gainers and Losers from the Minimum Wage Increase

		Malay	Chinese	Indian	Others
Share of formal workers below MW (%)	(1)	54	26	56	73
Monthly per capita income (MYR)					
Before minimum wages	(2)	2,701	4,398	3,406	2,615
After minimum wages	(3)	2,831	4,445	3,607	2,696
Income increase	(4)	4.80	1.06	5.89	3.09
Expenditure increase	(5)	1.80	1.68	1.85	1.60
Net effects	(6)	2.99	-0.62	4.04	1.49

Sources: Computed from the model

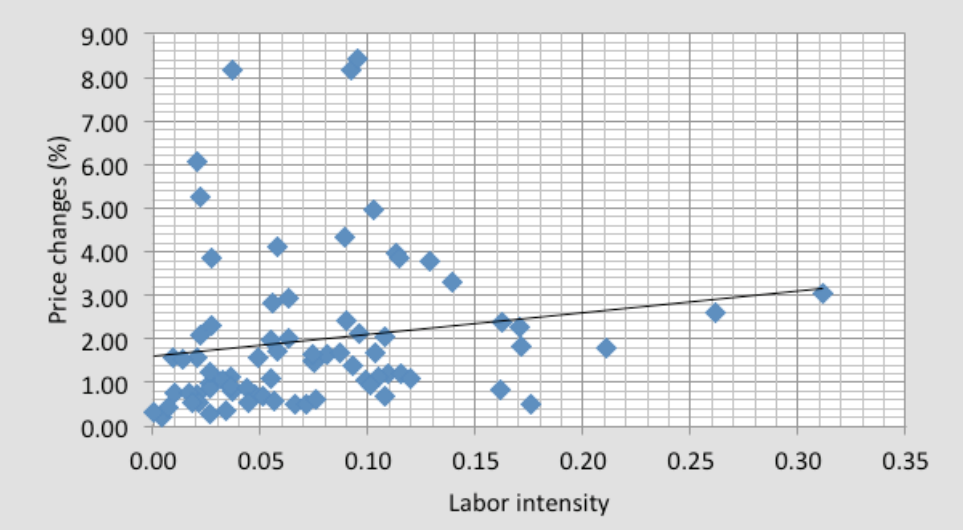

FIGURE 2.Relationship between Changes in Price and Labor Intensity
Sources: Computed from the model

intensity (measured by labor-output ratio) is ranked for all production sectors in Figure 2. Labor intensity refers to the labor requirement per unit of output produced and it can be derived by taking a ratio of labor over output for each sector. Higher (lower) labor-output ratio implies more (less) labor-intensity in a production sector. The results show that a positive and systematic relationship exists between the increase in prices and production labor intensity, (i.e., the increase in labor costs is mainly affected the labor-intensive sectors).

The results in row (5) indicate the percentage increase in household expenditure as a result of the increase in commodity prices. Overall, the expenditure effects of minimum wage demonstrate less variance across the ethnic groups. Among the major ethnic groups, the expenditure effects vary from 1.68% for ethnic Chinese; 1.80% for ethnic Malays; and 1.85% for ethnic Indians. The expenditures of ethnic Chinese are relatively less affected than other ethnicities because they consume a relatively lower proportion of goods and services that are produced by the sectors most affected by the minimum wage legislation. For example, the price of products produced by the fishing sector increases by 6.05% (see Appendix 1) and the expenditure of ethnic Malays in this sector is 1.24% larger than that of ethnic Chinese.

Row (6) brings the benefits and costs together to examine the net effects across ethnic groups. The net benefits are calculated as the average benefit to a household minus the average cost the household will pay due to the higher prices of goods and services. Ethnic Malays, ethnic Indians and other minority ethnicities are better off after the minimum wage increase. For ethnic Chinese, their income increase is lower than expenditure cost resulting in a negative net effect. The reduction in the real income of ethnic Chinese by 0.62% is considerably marginal and may not affect their welfare to a large extent given the fact that the per capita income of ethnic Chinese is the largest. The differences in income effects between ethnic Malays and ethnic Chinese explain why the gap in per capita income between these two ethnic groups marginally declines. Ethnic Indians benefit the most from the minimum wage increase with a net effect of 4.04% compared to ethnic Malays at 2.99%. As a consequence, the gap in per capita income between these two groups slightly increases.

CONCLUSIONS

The present study assesses the effectiveness of the minimum wage policy as a mechanism for income redistribution among different ethnic groups in Malaysia. The methodological approach takes into account the benefits and costs of the minimum wage increase. The findings suggest that the minimum wage increase will potentially boost the income of ethnic Indians, ethnic Malays and other minority ethnicities, whereas only slightly affecting ethnic Chinese. While distributional effects are the most common rationale for minimum wage policies, strong evidence to support this view is not found in the present study. It is unlikely that the minimum wage legislation will be an effective instrument for reducing income inequalities among ethnic groups. The main reason is that the direct effect of the minimum wage increase on workers in informal sectors, which are not covered by the minimum wage legislation. The simulation results indicate that only approximately 46% of workers will benefit from the minimum wage increase, while the remaining 54%, who are considered as informal workers, will receive no benefit. Since the majority of low-wage workers do not fall under the minimum wage standards,

they are effectively penalized by paying higher prices result from the increase in wage costs.

The results may highly sensitive to the definition of informal workers. Different definitions of informal workers may produce different results. In addition, the real income effects of minimum wage may vary subject to the degree of compliance by the producers. Furthermore, the results of the present study do not provide a contrasting view on the distributional effect of minimum wages compared to other studies (e.g., Alaniz et al. (2011) regarding Nicaragua; Bird and Manning (2008) regarding Indonesia; Gindling and Terrell (2005) regarding Costa Rica; and Maloney and Núnes (2004) regarding Colombia).

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APPENDIX

Percentage Increase in Commodity Prices Due to Minimum Wages

Sectors	Price	Sectors	Price
Agriculture	8.17	Plastics Products	1.45
Rubber	8.16	Sheet Glass and Glass Products	1.74
Oil Palm	8.44	Clay and Ceramic	1.83
Livestock	3.87	Cement, Lime and Plaster	0.98
Forestry and Logging	0.71	Concrete & Other Non-Metallic Mineral	1.13
Fishing	6.08	Iron and Steel Products	0.71
Crude Oil and Natural Gas	0.21	Basic Precious and Non-Ferrous Metals	0.81
Metal Ore Mining	1.07	Other Fabricated Metal Products	0.89
Stone Clay and Sand Quarrying	1.49	Structural Metal Products	1.15
Meat and Meat Production	3.97	Industrial Machinery	1.05
Preservation of Seafood	2.84	Office, Accounting and Computing	0.72
Preservation of Fruits and Vegetables	4.36	Radio, TV and comm. Equip	0.91
Dairy Production	1.98	Other Electrical Machinery	1.09
Oils and Fats	5.26	Ships and boats, and motorcycles	0.86
Grain Mills	2.93	Motor Vehicles	0.55
Bakery Products	3.31	Other Transport Equipment	0.75
Confectionery	1.57	Instruments and clocks	1.25
Other Food Processing	2.06	Other Manufacturing	1.39
Animal Feeds	1.58	Electricity and Gas	0.35
Wine and Spirit	2.01	Waterworks	0.51
Soft Drink	1.19	Constructions and building	1.08
Tobacco Products	1.55	Wholesale and Retail Trade	1.65
Yarn and Cloth	1.64	Hotels and restaurants	3.79
Finishing of Textiles	2.10	Transports	0.96
Other Textiles	2.42	Communication	0.57
Wearing Apparel	2.60	Banks	0.52
Leather Industries	4.98	Other financial services	0.61
Footwear	2.38	Insurance	0.55
Sawmill products	2.26	Real Estate	0.27
Other wood products	4.13	Ownership of Dwellings	0.34
Paper and Paper Products and Furniture	1.68	Business Services	1.69
Publishing and printing	0.83	Education	3.04
Industrial chemical and painting	0.78	Health	1.81
Pharmaceuticals, Chemicals & Botanical	1.20	Recycling	0.54
Soap, Perfumes, Cleaning & Toilet	1.58	Other Private Services	2.13
Petroleum Refinery	0.42	Public Administration	0.70
Rubber Processing	2.32	Defence and Public Order	0.51
Rubber products	3.86	Other Public Administration	0.54

Sources: Computed from the model